45 years of age. Before it was made compulsory, 17,000 officers and enlisted men had been vaccinated voluntarily. During the recent mobilization of troops in Texas, when the men were in camp for more than two months, under war conditions, only one case of typhoid resulted, that of a teamster who had not been vaccinated. This was in striking contrast to the Spanish-American war when within a period of three and one half months there were 20,738 cases with 1,580 deaths.

UNIVERSITY AND EDUCATIONAL NEWS

LARGELY through the efforts of Mrs. E. H. Harriman, a fund of $40,000 a year for five years has been provided to maintain an experimental school for the study and administration of public business. The school will be started in New York, but the scope is intended to be national. Mrs. Harriman personally consulted a number of business men, journalists, educators and public officials as to the need of providing such a training school, and their favorable replies resulted in her offer of a contribution to make possible a five years' test of such a school. Her own contribution was $40,000 for the first year and $10,000 for the succeeding years. Messrs. John D. Rockefeller, Andrew Carnegie, J. P. Morgan and others gave enough to provide for a total annual income of $40,000. The work will be carried on by the directors of the Bureau of Municipal Research.

THE statute allowing honor students in mathematics and natural science to dispense with Greek in responsions passed the Oxford congregation on November 7 by a vote of 33 to 11. It will now be submitted to convocation, the ultimate legislative authority of the university.

DR. EDMUND B. HUEY, who has for some time been making examinations of defective children and of aphasic patients at the Johns Hopkins Hospital, has been appointed lecturer on mental development in the Johns Hopkins University and assistant in psychiatry in the Phipps Clinic of the Johns Hopkins Hospital. From January to June, 1912, Dr. Huey will give, at the university, a series of weekly public lectures and clinics on the subject of backward and feeble-minded children, and on related phases of clinical psychology.

DR. ALFRED N. GOLDSMITH has been appointed instructor in physics in the College of the City of New York.

DR. ALEXANDER F. CHAMBERLAIN, hitherto assistant professor, has been promoted to a full professorship in anthropology at Clark University.

PROFESSOR R. I. SMITH, of the North Carolina College of Agriculture, has accepted a position with the Porto Rico College of Agriculture, taking up extension work in agricultural education. His address after January 1, 1912, will be Mayaguez, Porto Rico.

DISCUSSION AND CORRESPONDENCE

THE USE OF SODIUM BENZOATE AS A PRESERVATIVE OF FOOD

TO THE EDITOR OF SCIENCE: It seems proper that the following quotation of the Prussian Scientific Deputation of Medical Affairs should be published in addition to that copied by SCIENCE from an article in the *Journal of the American Medical Association,* that the American public shall not be misled:

In order to decide the question concerning the use of benzoic acid and its salts as a preservative of food, one must consider the result of the prolonged administration of these substances in small doses. Such experiments were carried out on twelve young men in the chemical laboratory of the Agricultural Department in Washington under the direction of Wiley. The persons experimented on received, in increasing quantities, between 0.5 to 2.5 grams of benzoic acid or benzoate in capsules during four periods of five days each. The majority of the persons experimented on experienced digestive and metabolic disturbances, gastric pain, vomiting and reduction in body weight, which decided Wiley to declare that the use of benzoate salts should not be allowed in the preservation of food. Since, however, doubts arose regarding the technic of these experiments and since the injury to the health of the individuals could not with certainty be attributed to the use of benzoate of soda, an American commission ap-

pointed by President Roosevelt has tested Wiley's results. Three independent series of experiments were carried out extending over a period of four months, by R. H. Chittenden at the Sheffield Scientific School, Yale University, on six young men, by J. H. Long at the Medical School of the Northwestern University in Chicago on six individuals and by Christian A. Herter in his private laboratory of Columbia University on four individuals. The experiments were so arranged that during two months 0.3 gram of sodium benzoate was given daily in three doses in the food or drink. During a third month the dose given was gradually increased at first to 0.6 and then to 1 gram, while in some experiments 4 and 6 grams were given daily. The experiments in which the dose of 0.6 to 1 gram were given lasted between 8 to 14 days, and with the largest doses 2 to 8 days. The food ingested and the excreta were analyzed and the individuals were carefully observed. The commission draws the following conclusions:

1. Sodium benzoate in small doses (under 0.5 gram) when given with food is harmless, is not poisonous and not injurious to health.

2. Larger doses of sodium benzoate (4 grams daily) are not injurious to health, and are not poisonous in the general sense of the term. In certain ways they exercise a slight action over certain physiological processes, the exact significance of which is not determined.

3. Addition of sodium benzoate in large or small doses to food exercises no injurious influence on the quality or the nutritive value of the food.

The changes in certain physiological phenomena mentioned under 2 are concerned with the observations of Herter. In his experiments sodium benzoate in the larger doses caused a slight increase in the indigo-forming substances in the urine, a change in the bacterial-flora of the feces and a decided increase in the production of hydrochloric acid in the gastric juice.

Putting everything together, it may be stated that benzoic acid and sodium benzoate exercise a poisonous action on the organism only when given in comparatively large amounts. The constant occurrence of hippuric acid (the substance produced by the union of benzoic acid and glycocoll) in human urine leads to the conclusion that small quantities of benzoate salts arising from vegetable food or products of its oxidation, are always circulating in the blood. One may conclude from this as well as from the experiments of the American Commission, that benzoic acid in amounts up to 0.5 gram distributed in small doses during the day are harmless to the human organism. Whether larger doses (amounts of several grams) can be constantly taken by all individuals with the same impunity can not now be stated. The experimental work of the American scientists in this particular was not continued long enough and their conclusion was associated with certain reservations, so that it can not be considered as affording the proof of absolute harmlessness.

For this report consult *Zeitschrift für Untersuchung der Nahrungs- und Genussmittel,* Bd. 22, p. 261, July 15, 1911.

With regard to the common origin of the garbled extracts of the Prussian Deputation's Report furnished to the American press, let the following sorrowfully be recorded:

The report made by the health officials of Germany on the use of benzoate of soda in foods and which sustains the position originally taken by Dr. Wiley, of the United States Bureau of Chemistry, and is antagonistic to the position taken by the Remsen Board, has been transmitted to the Agricultural Department by the officials of the State Department.—*Oil, Paint and Drug Reporter,* October 16, 1911.

and,

Until a question is settled right it will never stay settled, and the benzoate of soda controversy seems to be one of these questions. The latest to have a word on the question is the Scientific Deputation for Medical Affairs in Germany. . . . This deputation has taken the tests made by Dr. Wiley at their face value, thus confirming the stand taken by those in this country who would prohibit the use of benzoate of soda in all food products.—Government Agricultural Experiment Station, Agricultural College, N. D. *Special Bulletin,* Food Department. Vol. I., No. 36, September, 1911.

and,

The American public believes that a question is not settled until it is settled right. . . . Of the decision of the United States referee board, these German scientist say: "The series of experiments in this connection made by the American scientists are of too short duration and the results coupled with certain limitations, so that they can not be regarded as demonstrating the unconditional non-injurious nature."—*Journal of the American Medical Association,* Vol. XLVII., No. 19, November 4, 1911.

GRAHAM LUSK